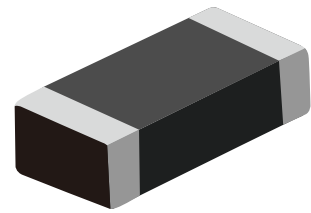


## FEATURES

- | Working Voltage From 5.5V to 385V DC
- | Low Capacitance Design (0.2pF) For Fast Data Transmission
- | Fast Response Time (<0.5ns)
- | Low Leakage Current
- | High Surge Current Ability
- | Suitable For ESD Protection
- | Bidirectional Clamping, High Energy
- | Good Temperature Coefficient



1812

## APPLICATIONS

- | Universal Serial Bus (USB)
- | Mobile Communication
- | Computer/DSP Product
- | Video and Audio Ports
- | Automotive Electronics
- | Armarium

## APPROVALS

|      |                                    |
|------|------------------------------------|
| RoHS | Compliance with 2011/65/EU         |
| HF   | Compliance with IEC61249-2-21:2003 |

## GENERAL CHARACTERISTICS DEFINITION

- | Operating Temperature Range :-55°C ~ +125°C
- | Storage Temperature Range :-40°C ~ +125°C

## ELECTRICAL CHARACTERISTICS

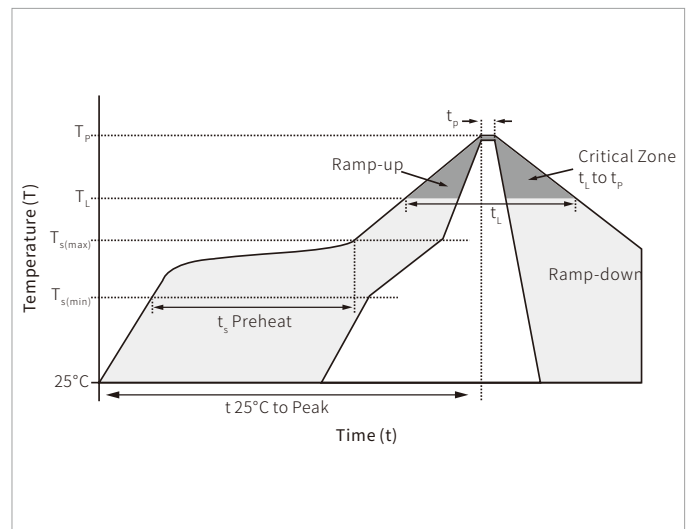
| Part Number    | Working Voltage     |                     | Breakdown Voltage @1mA DC (V) | Peak Current I <sub>pp</sub> (8/20μs) (A) | Clamping Voltage 8/20μs |     | Surge Voltage (V) |
|----------------|---------------------|---------------------|-------------------------------|-------------------------------------------|-------------------------|-----|-------------------|
|                | V <sub>ac</sub> (V) | V <sub>dc</sub> (V) |                               |                                           | (A)                     | (V) |                   |
| SMV1812B8.0A/H | 4                   | 5.5                 | 8(6.6-9.9)                    | 500/800                                   | 1-10                    | 18  | 1000 & 2000       |
| SMV1812B12A/H  | 7                   | 9                   | 12(10.2-13.8)                 | 500/800                                   | 1-10                    | 24  | 1000 & 2000       |
| SMV1812B18A/H  | 11                  | 14                  | 18(15.3-21.7)                 | 500/800                                   | 1-10                    | 30  | 1000 & 2000       |
| SMV1812B20A/H  | 12                  | 16                  | 22(19.8-24.2)                 | 500/800                                   | 1-10                    | 36  | 1000 & 2000       |
| SMV1812B24A/H  | 14                  | 18                  | 24(21.6-26.4)                 | 500/800                                   | 1-10                    | 38  | 1000 & 2000       |
| SMV1812B27A/H  | 17                  | 22                  | 27(24.3-29.7)                 | 500/800                                   | 1-10                    | 44  | 1000 & 2000       |
| SMV1812B30A/H  | 18                  | 24                  | 30(27.2-33.0)                 | 500/800                                   | 1-10                    | 48  | 1000 & 2000       |
| SMV1812B33A/H  | 20                  | 26                  | 33(29.7-36.3)                 | 500/800                                   | 1-10                    | 54  | 1000 & 2000       |
| SMV1812B36A/H  | 22                  | 28                  | 36(32.7-39.6)                 | 500/800                                   | 1-10                    | 59  | 1000 & 2000       |
| SMV1812B39A/H  | 25                  | 30                  | 39(35.1-42.9)                 | 500/800                                   | 1-10                    | 65  | 1000 & 2000       |
| SMV1812B42A/H  | 26                  | 33                  | 42(38.1-46.2)                 | 500/800                                   | 1-10                    | 72  | 1000 & 2000       |
| SMV1812B47A/H  | 30                  | 38                  | 47(42.3-51.7)                 | 500/800                                   | 1-10                    | 77  | 1000 & 2000       |
| SMV1812B56A/H  | 35                  | 45                  | 56(50.4-61.6)                 | 500/800                                   | 1-10                    | 90  | 1000 & 2000       |
| SMV1812B68A/H  | 40                  | 56                  | 68(61.2-74.8)                 | 500/800                                   | 1-10                    | 100 | 1000 & 2000       |
| SMV1812B76A/H  | 45                  | 60                  | 76(69.1-83.6)                 | 500/800                                   | 1-10                    | 126 | 1000 & 2000       |
| SMV1812B82A/H  | 50                  | 65                  | 82(73.8-90.2)                 | 500/800                                   | 1-10                    | 135 | 1000 & 2000       |
| SMV1812B101A/H | 60                  | 85                  | 100(90-110)                   | 500/800                                   | 1-10                    | 165 | 1000 & 2000       |
| SMV1812B121A/H | 75                  | 100                 | 120(108-132)                  | 500/800                                   | 1-10                    | 200 | 1000 & 2000       |
| SMV1812B171A   | 110                 | 140                 | 170(154-187)                  | 500                                       | 5-10                    | 300 | 1000 & 2000       |
| SMV1812B201A   | 130                 | 170                 | 200(185-225)                  | 500                                       | 5-10                    | 340 | 1000 & 2000       |
| SMV1812B221A   | 140                 | 180                 | 220(198-242)                  | 500                                       | 5-10                    | 360 | 1000 & 2000       |
| SMV1812B241A   | 150                 | 200                 | 240(216-264)                  | 500                                       | 5-10                    | 395 | 1000 & 2000       |
| SMV1812B271A   | 175                 | 225                 | 270(243-297)                  | 500                                       | 5-10                    | 455 | 1000 & 2000       |
| SMV1812B391A   | 250                 | 320                 | 390(351-429)                  | 500                                       | 5-10                    | 650 | 1000 & 2000       |
| SMV1812B431A   | 275                 | 350                 | 430(387-473)                  | 500                                       | 5-10                    | 710 | 1000 & 2000       |
| SMV1812B471A   | 300                 | 385                 | 470(423-517)                  | 500                                       | 5-10                    | 775 | 1000 & 2000       |
| SMV1812B511A   | 320                 | 415                 | 510(459-561)                  | 400                                       | 5-10                    | 845 | 1000 & 2000       |
| SMV1812B221H   | 140                 | 180                 | 220(198-242)                  | 800                                       | 5-10                    | 360 | 1000 & 2000       |
| SMV1812B241H   | 150                 | 200                 | 240(216-264)                  | 1000                                      | 5-10                    | 395 | 1000 & 2000       |
| SMV1812B271H   | 175                 | 225                 | 270(243-297)                  | 1000                                      | 5-10                    | 455 | 1000 & 2000       |
| SMV1812B391H   | 250                 | 320                 | 390(351-429)                  | 1000                                      | 5-10                    | 650 | 1000 & 2000       |
| SMV1812B431H   | 275                 | 350                 | 430(387-473)                  | 1000                                      | 5-10                    | 710 | 1000 & 2000       |
| SMV1812B471H   | 300                 | 385                 | 470(423-517)                  | 1000                                      | 5-10                    | 775 | 1000 & 2000       |

## ENVIROMENTAL RELIABILITY TEST

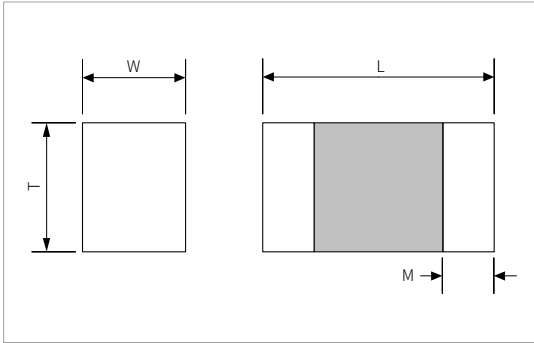
| Characteristic                   | Test method and description                                                                                                                                                                                                                       |          |                  |          |
|----------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|----------|------------------|----------|
| High Temperature Storage         | The specimen shall be subjected to 125°C for 1000 hours in a thermostatic bath without load and then stored at room temperature and humidity for 1 to 2 hours. The change of varistor voltage shall be within 10%                                 |          |                  |          |
| Temperature Cycle                | The temperature cycle of specified temperature shall be repeated five times and then stored at room temperature and humidity for one two hours. The change of varistor voltage shall be within 10%and mechanical damage shall be examined.        | Step     | Temperature      | Period   |
|                                  |                                                                                                                                                                                                                                                   | 1        | -40±3°C          | 30min±3  |
|                                  |                                                                                                                                                                                                                                                   | 2        | Room Temperature | 1~2hours |
|                                  |                                                                                                                                                                                                                                                   | 3        | 125±2°C          | 30min±3  |
| 4                                | Room Temperature                                                                                                                                                                                                                                  | 1~2hours |                  |          |
| High Temperature Load            | After being continuously applied the maximum allowable voltage at 85°C for 1000hours, the specimen shall be stored at room temperature and humidity for one or hours, the change of varistor voltage shall be within 10%                          |          |                  |          |
| Damp Heat Load/<br>Humidity Load | The specimen should be subjected to 40°C,90 to 95%RH environment, and the maximum allowable voltage applied for 1000 hours, then stored at room temperature and humidity for one or two hours. The change of varistor voltage shall be within 10% |          |                  |          |
| Low Temperature Storage          | The specimen should be subjected to -40°C, without load for 1000 hours and then stored at room temperature for one two hours. The change of varistor voltage shall be within 10%.                                                                 |          |                  |          |

## SOLDERING RECOMMENDATIONS

| Reflow Condition                                       |                                  | Lead-free assembly |
|--------------------------------------------------------|----------------------------------|--------------------|
| Pre Heat                                               | Temperature Max ( $T_{s(min)}$ ) | 150°C              |
|                                                        | Temperature Max ( $T_{s(max)}$ ) | 200°C              |
|                                                        | Time (min to max) ( $t_s$ )      | 60 – 180 secs      |
| Average ramp up rate (Liquidus Temp ( $T_L$ ) to peak) |                                  | 3°C/second max     |
| $T_{s(max)}$ to $T_L$ - Ramp-up Rate                   |                                  | 3°C/second max     |
| Reflow                                                 | Temperature ( $T_L$ ) (Liquidus) | 217°C              |
|                                                        | Time (min to max) ( $t_L$ )      | 60 – 150 seconds   |
| Peak Temperature ( $T_p$ )                             |                                  | 260°C              |
| Time within 5°C of actual peak Temperature ( $t_p$ )   |                                  | 20 – 40 seconds    |
| Ramp-down Rate                                         |                                  | 6°C/second max     |
| Time 25°C to peak Temperature ( $T_p$ )                |                                  | 8 minutes max.     |
| Do not exceed                                          |                                  | 260°C              |



## DIMENSION SPECIFICATION



| Size | L(mm)     | W(mm)     | T(mm)    | M(mm)     |
|------|-----------|-----------|----------|-----------|
| 1812 | 4.50±0.40 | 3.20±0.30 | 3.20Max. | 0.25-1.00 |

## DRDORDERING INF ORMATIOON

| Part Number | Component Package | QTY/Reel | Reel Size |
|-------------|-------------------|----------|-----------|
| SMV1812     | 1812              | 1000PCS  | 7"        |

**Headquarters**

No.3387 Shendu Road  
Pujiang I&E Park  
Minhang Shanghai China  
201000

**Hotline**

400-021-5756

**Web**

<https://www.semiware.com>

**Sales Center**

Tel: 86-21-3463-7458  
Email: [sales18@semiware.com](mailto:sales18@semiware.com)

**Customer Service**

Tel: 86-21-5484-1001  
Email: [sales17@semiware.com](mailto:sales17@semiware.com)

**Technical Support**

Tel: 86-21-3463-7654  
Email: [fae01@semiware.com](mailto:fae01@semiware.com)

**Complaint & Suggestions**

Tel: 86-21-3463-7172  
Ext: 8868  
Email: [cs03@semiware.com](mailto:cs03@semiware.com)

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